

A NEW GENUS OF AUSTRALIAN CLAVICORN COLEOPTERA, PROBABLY OF A NEW FAMILY.

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(Communicated by Dr. P. B. Carne.)

(Seventeen Text-figures.)

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Synopsis.

A new genus, *Cavognatha*, is described for a new species, *C. pullivora*, both larva and adults being described. The beetles probably represent a hitherto undefined family of Cucujoidea; possible adaptive significances of some of their characters are briefly mentioned.

A year or two ago Dr. P. B. Carne of the Division of Entomology, C.S.I.R.O., Canberra, sent me for identification a series of coleopterous larvae together with three adults reared from similar larvae, all the larvae collected from nestlings of a native bird at Gungahlin, A.C.T., on October 28, 1958, by Dr. R. Carrick; subsequently I received a fairly long series of adults of the same species, also from Gungahlin, collected by W. J. M. Vestjens. The characters of both adults and larvae proved to be unusual and interesting, the species apparently representing a hitherto undescribed genus. Both larval and adult characters are unmistakably of Cucujoidea-Clavicornia, but in neither stage are the Gungahlin insects satisfactorily assignable to any Clavicorn family hitherto described. In the circumstances it seemed best to me to postpone serious study of the species until I began a projected major revisional study of Cucujoidea. However, as it is now desired to refer to this species in ecological publications, the opportunity is taken to publish generic and specific diagnoses of it.

By adult characters, the Gungahlin insects would trace to couplet 12 in my previously published key to families of Clavicornia (Crowson, 1955, pp. 91-98), but they cannot be attributed to either of the two families (Cucujidae and Silvanidae) in that couplet. At least three other clavicorn genera from Australia appear to belong to the same family as the Gungahlin species; before the family can be characterized it will, however, be necessary to study these genera more fully than I have yet been able to.

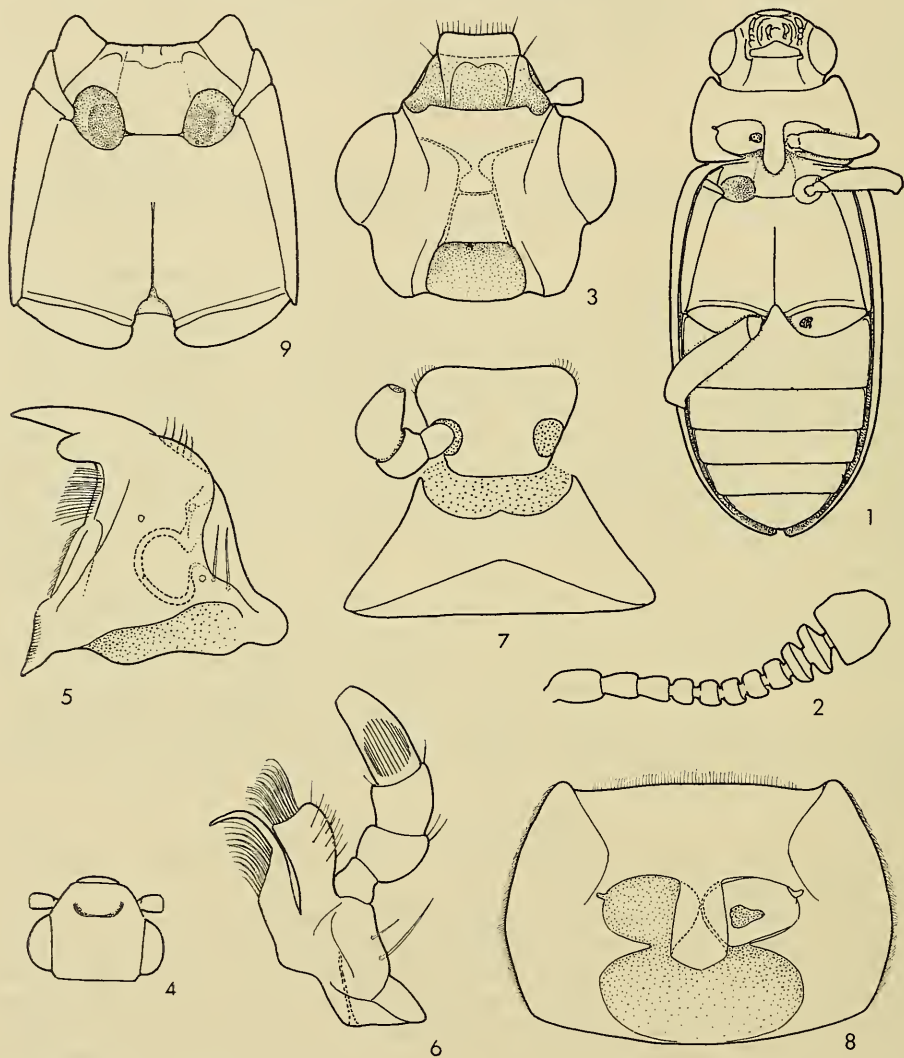
CAVOGNATHA, gen. nov.

Type species: *Cavognatha pullivora*. sp. nov. (The Latin-Greek generic name refers to the adult mandibles.)

With the general characters of Polyphaga-Cucujoidea-Clavicornia.

Adult: General form (Fig. 1) elongate and sub-parallel sided, only slightly depressed. Tarsal formula 5-5-5 in both sexes, segments 1-4 of nearly equal length but progressively narrower, none of them lobed below, segment 5 about as long as 2-4 together; claws simple, empodium inconspicuous. Antennae (Fig. 2) relatively short and thick, 11-segmented with 3-segmented club, segment 11 polygonal and longer than 9 and 10 together. Front coxae transverse, their cavities (Fig. 8) with narrow angular external prolongations in which the trochantins are partly exposed, coxal cavities partly closed behind by hypomerical processes; prosternal intercoxal process unusually broad, apically prolonged and received in the slightly hollowed median part of the mesosternum. Middle coxal cavities (Fig. 9) rather widely separated, the mesepimera broadly reaching them, trochantins partially exposed, meso- and metasterna meeting in a rather long nearly straight line. Hind coxae not quite as widely separated as middle ones, extending laterally a little beyond outer edges of metasternum

but not meeting elytral epipleura. Metasternum with strong median impressed line in posterior $\frac{3}{4}$, the hind margin rather deeply, broadly and angularly excavate between the coxae, receiving the angular process of the first ventrite; metepisterna exposed, narrow posteriorly and much broadened in front, their inner apical angles prolonged. Ventrites 5 in both sexes, the first longest, 2 slightly shorter, 3-5 of equal length and shorter than 2, all of them with distinct raised lateral margins.



Text-figs 1-9. *Cavognatha pullivora*, n. sp. 1, whole insect, ventrally, antennae and parts of legs removed; 2, antenna; 3, head capsule, mouth-parts removed, tentorium dotted; 4, head, dorsal view; 5, right mandible, dorsal view; 6, right maxilla (without cardo), dorsal view; 7, labium, ventral view; 8, prothorax, ventral view, right coxa removed; 9, meso- and meta-thorax, ventrally, middle coxae removed.

Head (Fig. 3) markedly constricted just behind the entire moderately convex eyes, antennal insertions lateral, just in front of eyes; fronto-clypeal suture not distinct; labrum very short, transverse, its front margin arcuately emarginate; genae, between eyes and maxillae, channelled so as to receive retracted bases of antennae; gular sutures short, widely separated, labium borne on a short peduncle under the sides of

which the cardines are partly hidden. Mandibles (Fig. 5) with a sharp apical tooth, a blunt pre-apical one, a prosthecal tuft of long stiff setae, and a less sclerotized setose tract between it and the molar area, the latter only slightly protuberant, oblique, finely asperate, and basally prolonged; basal part of outer face of mandible deeply channelled and opening by a narrow passage into a large ovate internal cavity. Maxillae (Fig. 6) with 4-segmented palpi, segment 4 about as long as 2 and 3 together, slightly narrowed to its apex, its dorsal face with a number of parallel longitudinal impressed lines; galea short, 1-segmented, with a dense apical tuft of slightly curved setae; lacinia narrower, with a strong apical hook and a tract of slightly curved setae behind it. Labium (Fig. 7) with trapezoidal mentum whose sides are strongly convergent and distal edge is strongly emarginate; prementum slightly transverse, its front margin corneous and nearly straight; palpi 3-segmented, apical segment strongly curved, much widened in its basal part and strongly narrowed to apex. Tentorium (Fig. 3) of normal clavicorn type.

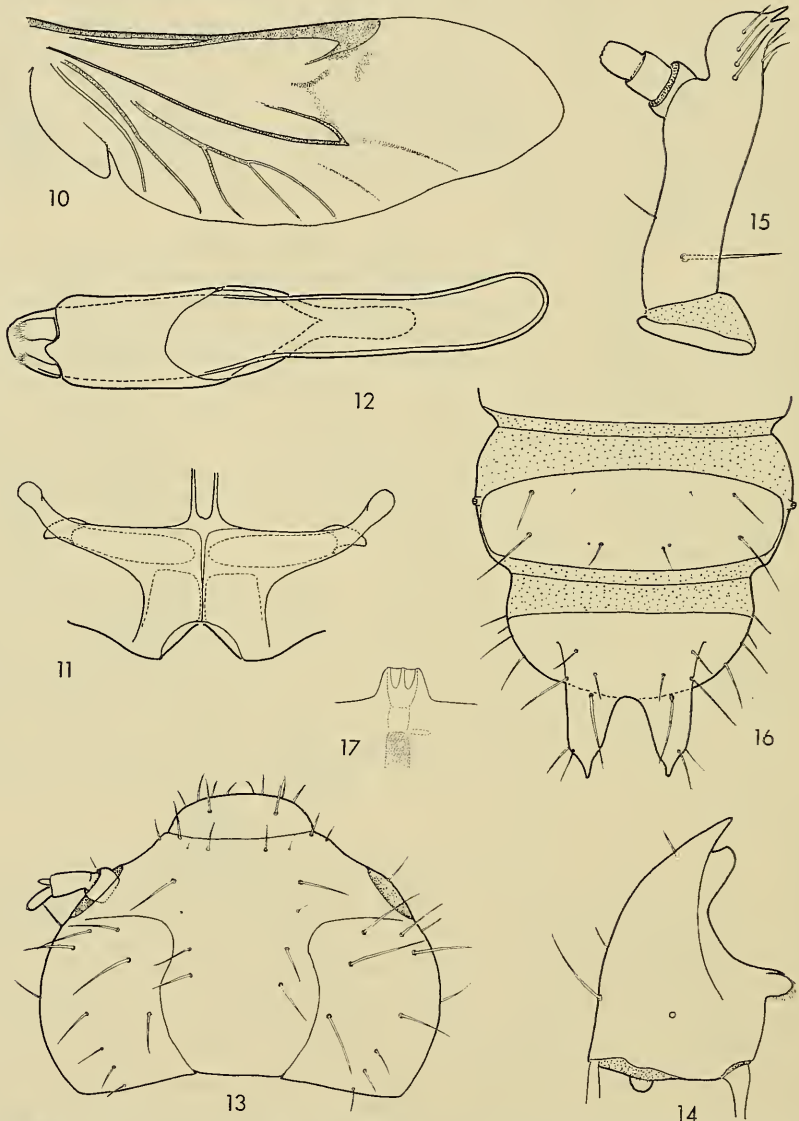
Pronotum more or less uniformly convex, without marked impressions, its side margins complete, running into front and hind margins without marked angles; sternopleural sutures of prothorax rather deeply recessed along outer edges posteriorly. Elytra unusually elongate, side margins slightly curved, upper surface fairly evenly convex, entire and fully covering the abdomen; epipleura oblique, more or less distinct almost to apex, their outer edges obtuse as in *Cryptophagidae*. Scutellum very transverse. Wings (Fig. 10) with five Anal veins in main group, no distinct Anal cell, Radial cell open, r-m cross-vein indistinct and without a spur. Metendosternite (Fig. 11) resembling those of other primitive *Clavicornia* (e.g., *Sphindus*). Legs with trochanters neither elongate nor heteromeroid, femora moderately thickened in middle, tibiae with rounded outer edges, without keels or denticles, apical margins with a circle of spines, two normal spurs on all legs.

Abdominal tergite 8 normally hidden in both sexes, tergites 1-7 all dark coloured and more or less sclerotized, 2-6 each with a well-marked paratergite on each side, 5-7 with progressively larger paired posterior rubbing areas, spiracles of 7 in edge of tergite, those of 2-6 just outside paratergites. Male with tergite 8 not at all hooded, sternite 8 small and weakly sclerotized, sternite in female nearly as large as tergite, in both sexes with long spiculum gastrale. Aedeagus (Fig. 12) of inverted cucujoid type with short articulated parameres, resembling those of some *Cucujidae*. Ovipositor short, baculi less than $1\frac{1}{2}$ times as long as 8th tergite, valvifers large, rectangular, slightly transverse, coxites slightly elongate, styli about as long as and half as wide as coxites.

Larva: Form elongate, slightly depressed, of practically even width from prothorax to abdominal segment 7, head very slightly narrower than prothorax, abdominal segment 8 slightly narrower than 7, 9 about $\frac{2}{3}$ as wide as 8, pygopod (segment 10) situated ventrally, about half as wide as 9. Thoracic and abdominal segments all with dark sclerotized tergites, those of thorax each with a pale median line. Protergite about three times as wide as its median length, tergites of next 10 segments each about five times as wide as long, separated from each other by relatively wide pale areas. Pigmented area of protergite with a long seta at each anterior angle, and a few small scattered setae, succeeding tergites each with an anterior and a posterior transverse line of various sized setae. Abdominal tergite 9 as figured (Fig. 16) with a pair of stout, nearly straight, slightly divergent pointed urogomphi, pygopod with well sclerotized tergite. No evident sclerotizations in sternal region of abdomen.

Head capsule (Fig. 13) short and broad, rounded at sides, frontal sutures of typical cucujoid form, no median epicranial suture or endocarina, fronto-clypeal suture indistinct. Labrum free, short and transverse with evenly rounded front margin, the middle of its under surface (epipharynx) with six short seta-like processes in an irregular transverse row. Distinct short hypostomal rods diverging backwards from outer basal angles of maxillae. Six ocelli on each side, an anterior vertical row of 4, posterior row of 2 parallel to top 2 of front row. Antennae 3-segmented, segment 1

short and transverse, 2 elongate and tapered to its base, its broad apical surface bearing posteriorly the small elongate 3rd segment and anteriorly a pale conical sensory appendage. Mandibles (Fig. 14) as figured, with a sharp apical and blunt pre-apical tooth, no distinct prostheca, the molar area represented by a weakly sclerotized pointed process and a setose lobe. Maxillae (Fig. 15) with short 3-segmented palpi,



Text-figs 10-17. *Cavognatha pullivora*, n. sp. 10, wing; 11, metendosternite, dorsal view; 12, aedeagus, ventral view; 13, head capsule of larva, dorsal view; 14, left mandible of larva, dorsal view; 15, left maxilla of larva, dorsal view; 16, end of abdomen of larva, dorsal view; 17, larval spiracle.

mala with outer apical margin strongly rounded, a pair of stout teeth at inner apical angles, dorsal surface with a row of fairly stout setae. Stipes very long, cardo rather small, articulating area of moderate size. Labium with short 2-segmented palpi, hypopharyngeal sclerome simple and rather weakly sclerotized, supported by a well-marked hypopharyngeal bracon.

Spiracles (Fig. 17) small and biforous, situated on short tubular projections, the anterior pair between prothorax and mesothorax, the eight abdominal ones situated somewhat dorsally and near the middle of the segments.

Front coxae separated by about their own width, middle and hind coxae by about twice their own width; prosternum with four long setae, meso- and meta-sterna each with six. Legs relatively short, femora and tibiae each about twice as long as its width and bearing a small number of setae but no specialized spines; tarsungulus claw-like, strongly sclerotized, its two ventral setae in longitudinal succession.

CAVOGNATHA PULLIVERA, sp. nov. (Figs 1-17.)

General body surface more or less uniformly brownish and with recumbent pubescence. Dorsal surface of head (Fig. 4) with a rather deep characteristic impression between bases of antennae, moderately closely punctured, the pubescence directed backwards and in posterior part somewhat medially. Pronotum about $2\frac{1}{2}$ times as wide as its median length, front $\frac{2}{3}$ of side margins gently curved and convergent, hind $\frac{1}{3}$ rather more sharply contracted to base (Fig. 8); dorsal surface moderately strongly, closely and uniformly punctured, the long recumbent pubescence directed posteriorly along the median tract, postero-medially along front $\frac{2}{3}$ of lateral parts, antero-medially in hind $\frac{1}{3}$ of them. Elytral punctures rather smaller than, and not quite as close as, those of pronotum, with no tendency to be arranged in rows, pubescence nearly as long as that of pronotum and directed posteriorly; suture slightly raised and marked off by a groove in posterior $\frac{1}{3}$; elytral surface with faint traces of striae in some specimens. Puncturation and pubescence of under surface distinctly less conspicuous than those of upper side. Male with segments 1-3 of front tarsi wider, and with denser setal brushes, than in female.

Holotype and paratypes from Gungahlin, A.C.T., 13 Dec. 1959; paratypes from nestlings of *Gymnorhina tibicen*, Gungahlin, 28 Oct. 1958. All type material in Australian National Insect Collection, Canberra.

Perhaps the most distinctive feature of *Cavognatha* is the mandibular cavities which have suggested the generic name. The mouth-parts of *C. pullivora* show similarities to those of various carrion-eating Coleoptera, for example, the maxillae are much like those of *Dermestes* spp. and, except for the cavities, the mandibles resemble those of such Nitidulidae as *Nitidula* and *Omosita*. Cavities opening on the dorsal (not the lateral) face of the mandibles are present in Sphindidae—in a specimen of *Sphindus grandis* these cavities contain evident spores, their function in Sphindids may well be the transport of spores of the Mycetozoa on which the insects feed. Possibly *Cavognatha* adults may transport bacterial spores or cultures in the cavities of their mandibles.

Reference.

Crowson, R. A., 1955.—“The Natural Classification of the Families of Coleoptera.” Nathaniel Lloyd, London.